

REMARKS

The Office Action mailed September 10, 2003, has been received and reviewed. Claims 1 through 4, 6 through 22, 24, 25, and 28 through 40 are currently pending in the application. Claims 10 through 12 have been withdrawn from consideration as being drawn to a non-elected invention. Claims 1 through 4, 6 through 9, 12 through 22, 24, 25, and 28 through 40 stand rejected. Applicants have amended claims 1, 22, 33 and 36, and respectfully request reconsideration of the application as amended herein.

Information Disclosure Statement(s)

Applicants note the filing of an Information Disclosure Statement herein on December 14, 2000 and note that no copy of the PTO-1449 was returned with the outstanding or previous Office Actions. Applicants respectfully request that the information cited on the PTO-1449 (which is the same as that of record to that date in the parent application hereto) be made of record herein. Pursuant to the Examiner's request, Applicants have enclosed a second copy of the December 14, 2000 Information Disclosure Statement and PTO-1449 and request that a copy of the same, as initialed by the Examiner, be returned to Applicants' counsel.

35 U.S.C. § 112 Claim Rejections

Claims 2, 3, 18, and 28 through 30 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 2, 3 and 18

In paragraph [0016], Applicants' specification states that "The solder mask has a thickness which is substantially the same as the desired height of the conductive structures to be formed with the solder mask." Applicants contend that situations such as that referred to by the

Examiner in Fig. 2 of U.S. Patent 4,763,829, which may seem to make the above statement an inadequate directive, do not need to be addressed by addition of a precise limitation relating the thickness of the solder mask with the height of the conductive structures. First due to the specific nature of the mask material, the conductive structure material and dimensions which are used, the size of the conductive structures or thickness of the solder mask may vary somewhat as the conductive structures are formed. Second, Applicants respectfully submit that it is not undue experimentation to run one test (or calculation based upon the properties of the materials) to determine the amount of conductive material required to fill the aperture, given the bulge of conductive material from the mouth of the aperture.

An arbitrary range, such as plus or minus fifty percent such as suggested by the Examiner, is unnecessary when the knowledge available to one skilled in the art can more easily provide guidance as to the meaning of “substantially” in this case.

Applicants thus submit that claims 2, 3 and 18 meet the requirements of 35 U.S.C. § 112, second paragraph, “point[ing] out and distinctly claim[ing] the subject matter which the Applicant regards as his invention.”

Claims 28 through 30

Applicant refers the Examiner to paragraph [0034], where non-photoimagable materials, such as glasses, are applied by methods such as curtain coating and roller coating. One way of performing these applications with these materials would be the use of materials which have been warmed in order soften and apply them (claim 28). Roller coating is a method of applying by spreading across an active surface (claim 29). In addition, application by spinning is specifically disclosed in paragraph [0033] (claim 30).

Many of the materials that may be used to form a solder mask according to the present invention may, as is well known in the art, be softened or melted. Applicants, therefore, respectfully submit that the requirements of 35 U.S.C. § 112, second paragraph, are met with respect to claims 28 through 30.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 5,587,342 to Lin et al.

Claims 1, 6, 8, 9 through 11, 13 through 17, 19 through 22, 24, 25, and 31 through 40 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Lin et al. (U.S. Patent No. 5,587,342). Applicants note that claims 10 and 11 have been withdrawn in an earlier response. Applicants respectfully traverse the Examiner's rejection of the remaining claims as follows.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Applicants have amended independent claims 1, 22, 33 and 36 to recite that the solder mask by which the conductive structures are formed is *partially* removed. In particular, claim 1 now reads "partially exposing a lateral periphery of the conductive structure through said layer." Claim 22 has been amended to read "said solder mask material facilitating a *partial* reduction in said thickness when the conductive structure has been at least partially formed in said at least one aperture." Claims 33 and 26 have been similarly amended. Support for the amendments can be found in the specification at paragraphs [0038] through [0040].

Lin, in contrast, discloses the complete removal of the solder mask. The Examiner is directed to Figure 7 of Lin and the associated text at Col. 4, lines 34 through 47. It should be noted that Lin also suggests the possibility not removing the mask at all, and allowing it to remain as a "passivation layer." This is, however, different from the partial removal required by each of independent claims 1, 22, 33, and 36. Applicant, therefore, respectfully submits that claims 1, 22, 33, and 36 are allowable over Lin under 35 U.S.C. § 102(b), and that claims 6, 8, 9, 13 through 17, 19 through 21, 24, 25, 31, 32, 34, 35, and 37 through 40 are allowable as depending from allowable independent claims.

Anticipation Rejection Based on U.S. Patent No. 4,763,829 to Sherry

Claims 1, 2, 3, and 18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Sherry (U.S. Patent No. 4,763,829).

Figure 3 of Sherry shows the complete removal of a solder mask, and none of the text in the reference contemplates anything other than full removal. Applicant thus submits that amended independent claim 1 is allowable over Sherry under 35 U.S.C. § 102(b), and that claims 2, 3, and 18 are allowable as depending from an allowable independent claim.

Anticipation Rejection Based on Japanese Patent No. JP 6-177527 to Ono

Claims 1, 4, and 7 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ono (Japanese Patent No. JP 6-177527).

As with the above rejections, Applicant respectfully submits that Ono, too, fails to disclose anything other than total removal of a solder mask layer. The Examiner's attention is respectfully directed toward the Abstract and Figures of the partial translation, in particular, Figures C and D, which show the complete removal of the solder mask layer. As Ono does not expressly or inherently describe each and every element of amended independent claim 1, Applicant respectfully submits that, under 35 U.S.C. § 102(b), amended independent claim 1 is allowable over Ono, and that claims 4 and 7 are allowable as depending from claim 1, which is allowable.

Anticipation Rejection Based on U.S. Patent No. 4,172,907 to Mones et al.

Claims 33, 35, 36, 39, and 40 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Mones et al. (U.S. Patent No. 4,172,907).

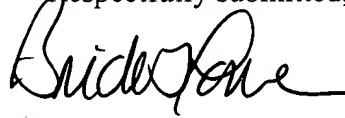
Applicants respectfully point out that independent claims 33 and 36, as presently amended, require the use of a solder mask. Mones does not expressly or inherently describe such an element. A solder mask is used in the formation of the conductive structures on a semiconductor device or substrate. Mones, in contrast discloses structures on which conductive structures are already fabricated. Note the Abstract of Mones, which describes the application of protective coatings to semiconductor structures, including conductive elements which are already

formed. Applicants thus submit that, under 35 U.S.C. § 102(b), amended independent claims 33 and 36 are allowable over Mones, with 35, 39 and 40 being allowable for depending from allowable independent claims.

CONCLUSION

Claims 1 through 4, 6 through 9, 13 through 22, 24, 25 and 28 through 40 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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Date: December 10, 2003
BGP/ps:djp

Attachments: Second copy of Dec. 14, 2000 Information Disclosure Statement and PTO-1449